

Additional funding for the President's Malaria Initiative has been allocated under a Continuing Resolution from Congress for the remainder of FY07. USAID Malaria Programs were allotted \$248 million (\$25 million above the President's 2007 request) to allow the Agency to expand its bilateral global malaria initiative activities from the current 3 countries to 7. Country programs will expand access to long-lasting insecticide treated bed nets and indoor residual spraying, promote and support effective malaria treatment through the use of proven combination therapies; and increase prevention efforts targeted to pregnant women. With the additional funding FY 2007 Malaria Operational Plans (MOPs) will be updated. Revised MOPs will be posted soon.

PRESIDENT'S MALARIA INITIATIVE

UGANDA

Malaria Operational Plan (MOP)

FY 2007

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ABBREVIATIONS

ACT	Artemisinin-based combination therapy
AED	Academy for Educational Development
ANC	antenatal clinic
AQ	amodiaquine
AS	artesunate
BCC	behavior change communication
cACT	community-based ACTs
CDC	Centers for Disease Control and Prevention
CDD	community drug distributors
CPHL	Central Public Health Laboratory
CQ	chloroquine
CSO	community service organizations
DDT	dichloro-diphenyl-trichloroethane
DFID	United Kingdom Department of International Development
DHS	Demographic and Health Survey
DOT	directly observed treatment
DSS	demographic surveillance system
EANMAT	East African Network for Monitoring Anti-malarial Treatment
EIR	entomological inoculation rate
ESR	epidemic surveillance and response
FANC	Focused antenatal care
FBOs	faith-based organizations
GFATM	Global Fund to Fight AIDS, Tuberculosis, and Malaria
GOU	Government of Uganda
HBMF	Home Based Management of Fever
HFS	health facility survey
HMIS	health management information systems
HPC	Health Partners in Communication
HSSP	Health Sector Strategic Plan
ICCM	Inter-Agency Coordination Committee for Malaria
IDI	Infectious Disease Institute
IDP	internally displaced person
IEC	information, education and communication
IMCI	integrated management of childhood illnesses
IPT	intermittent preventive treatment
IRS	indoor residual spraying
ITN	insecticide-treated net
JHU/CCP	Johns Hopkins University Communications for Change Project
JICA	Japanese International Cooperation Agency
JSI	John Snow International
LLIN	long-lasting insecticide-treated net
MEMS	Monitoring and Evaluation Management Systems
MIP	malaria in pregnancy

MOH	Ministry of Health
NDA	National Drug Authority
NGO	non-governmental organization
NMCP	National Malaria Control Program
NMS	National Medical Stores
PEPFAR	President's Emergency Plan for HIV/AIDS Relief
PERSUAP	Pesticide Evaluation Report and Safe Use Action Plan
PMTCT	prevention of mother to child transmission
RBM	Roll Back Malaria
RDT	rapid diagnostic test
RH	Reproductive Health
RTI	Research Triangle Institute
SP	Sulfadoxine-Pyrimethamine
SWAp	sector-wide approach
UCSF	University of California, San Francisco
UDHS	Uganda Demographic and Health Survey
UgSPA	Uganda Service Provision Assessment
UHSBS	Uganda HIV Sero-Behavioral Survey
UMSP	Uganda Malaria Surveillance Project
UNBS	Uganda National Bureau of Standards
UNICEF	United Nations Children's Fund
UPHOLD	Uganda Program for Human and Holistic Development
USAID	United States Agency for International Development
USG	United States Government
WHO	World Health Organization
WHOPES	World Health Organization Pesticide Evaluation Scheme

EXECUTIVE SUMMARY

Uganda's leading cause of morbidity and mortality is malaria, which is endemic in 95% of the country. Estimates show that malaria accounts for about 25-40% of outpatient visits to health facilities and the annual number of deaths attributable to malaria ranges from 70,000 to 100,000. Children under five years of age are most affected by malaria and nearly half of hospital inpatient pediatric deaths are due to malaria.

Uganda has made progress in scaling-up malaria prevention and treatment activities. Responding to the reality that for most caretakers self-medication is the first treatment choice, Uganda has implemented its Home-base Management of Fever (HBMF) program. This has increased the number of children under five receiving malaria treatment within 24 hours of onset of fever by 50%. The Ministry of Health has also recently adopted artemisinin-based combination therapy (ACT) as the official treatment policy and introduced intermittent preventive treatment (IPTp) of malaria in pregnancy for use in some antenatal clinics (ANC). Household net ownership is now calculated at approximately 25%. The National Malaria Control Program (NMCP) is currently using indoor residual spraying (IRS) to prevent malaria in epidemic-prone districts.

The President's Malaria Initiative (PMI) will support existing NMCP strategies and will coordinate closely with international and national partners to complement their funding and efforts. To achieve the goal and targets of the PMI in Uganda, the following major activities will be supported in year two of the Initiative:

1. Distribution of free ITNs to vulnerable groups through ANC clinics, large-scale campaigns, and to net facilities where non-governmental organizations and faith-based organizations can subsidize sales of ITNs to the lower wealth quintiles as well as the sale of ITNs through the retail market;
2. Conduct IRS with effective insecticides in two epidemic-prone districts, a high transmission district and IDP camps in Northern Uganda;
3. Support ACT policy implementation and strengthening logistics and distribution systems to ensure that ACTs are available in health facilities;
4. Revitalize the national IPT plan by continuing to support and training private and NGO health workers; and
5. Involve the private sector/NGOs/FBOs in malaria control activities.

The PMI will include a strong monitoring and evaluation component to measure progress against project goals and targets, to identify problems in program implementation, to allow modifications to be made efficiently if and when they are needed, and to confirm that those modifications are having their desired effect. This plan will be coordinated with the NMCP, the GFATM, and other partners to standardize data collection and reporting.

This document presents a detailed one-year implementation plan for the second year of the PMI in Uganda. It briefly reviews the current status of malaria control policies and interventions in Uganda, identifies challenges and unmet needs if the targets of the PMI are to be achieved and provides a description of proposed year two activities under the PMI. The MOP was developed in cooperation and consultation with the National Malaria Control Program and other stakeholders.

Resistance to SP as well as CQ/SP continued to rise and reached an average of 16% and 12% respectively during the period 2002-2004. At the same time, studies indicated excellent efficacy of $\geq 98\%$ for ACTs, namely artesunate/amodiaquine (AS/AQ) and artemether/lumefantrine (AL) (brand name Coartem®). Based on these results, the Government of Uganda (GOU) changed the first-line treatment policy to artemether/lumefantrine and AS/AQ was named the alternative first-line treatment. Last year with the support of the GFATM Round Four grant, Uganda implemented this change nationally at the health facility level.

Although progress has been made, timely treatment of malaria remains a problem. The first treatment choice for more than two-thirds of caretakers is self-medication, with only a quarter of them seeking treatment at a health facility. To address this situation and to ensure that children under five receive appropriate treatment for malaria, in 2002 Uganda began implementing the Home Based Management of Fever (HBMF) program to complement the availability of free malaria treatment through public health facilities. This program is designed to put malaria treatment for young children into the hands of caregivers. As part of the HBMF program, community volunteers in districts nationwide (as of October 2005) distribute pre-packaged, age-specific, CQ/SP “Homapak” malaria treatment kits to mothers/caregivers of young children with instructions on proper use. A 2003 evaluation of the HBMF program found an increase from 7.3% in 2001 to 39.2% of children under five receiving treatment within 24 hours in the nine districts implementing the HBMF intervention at the time.³ In April 2005, this figure increased to 66% of children receiving treatment within 24 hours of onset of fever in districts implementing HBMF.

Although the first-line treatment for malaria has changed to ACT, Uganda still uses a combination of CQ/SP in its HBMF program. The recrudescence rate varies broadly, ranging from 22% in Apac to 67% in Kanungu.⁴ Issues around drug resistance have prompted the government of Uganda to plan a transition from CQ/SP to ACTs as part of the HBMF. Currently there is no evidence on how ACTs would best be implemented, how efficacious they are, and/or the costs of using them at the village level through a HBMF program. The MOH has begun implementation of community-based ACTs in four northern Uganda districts (Pader, Kitgum, Gulu and Kotido); however, until more is understood about community-based distribution of ACTs, the MOH will continue to use CQ/SP for HBMF in the remaining 76 districts of the country. In year one, the PMI supported operations research to examine these questions.

IPTp for the prevention of malaria in pregnancy is being implemented in all health facilities that offer antenatal care (ANC) services. According to the NMCP, approximately 34% of women attending ANC clinics receive two doses of IPTp.⁵

Household ownership of any type of net has increased over the past five years from 13.2% to 25.9%, and the proportion of children under five sleeping under a treated net has also increased to

³ Fapohunda, B.M; Beth, A.P., et al (2004). The home based management of fever strategy in Uganda: survey report 2004. BASICS II/MOH/WHO/USAID, Kampala

⁴ Bakyaita et al, AJTMH 2005.

⁵ Achievement, Challenges and areas of Concern for National Malaria Control Programme for HSSP I, JB Rwakimari, April 2005.

about 15%. There remains a clear need to increase coverage of ITNs and long-lasting insecticide-treated nets (LLINs).⁶

In the past, IRS has only been implemented in selected district sub-counties on a limited scale and usually in response to large increases in numbers of clinical malaria cases. In 2006, the PMI supported IRS in the entire district of Kabale in southwestern Uganda with lambda-cyhalothrin. The NMCP plans to begin an IRS program targeting the highland districts at-risk of epidemic malaria using the GFATM Round Two Phase Two⁷ grant funds. The NMCP also hopes to implement spraying in Apac district (the highest endemic area of Uganda) and in selected internally displaced persons (IDP) camps in 2007-2008.

Uganda has become a model for HIV/AIDS prevention treatment and care. Through the President's Emergency Plan for AIDS Relief (PEPFAR), the United States Government has worked with local partners to develop HIV/AIDS care and support for people living with HIV/AIDS (PLWHA). These palliative care projects provide malaria prevention and treatment through promotion of ITNs and treatment for this vulnerable population.

Government health sector

Within the formal government health sector, preventive and curative malaria interventions have been incorporated as part of the Minimum Health Care Package delivered at the primary health care level. Primary health care centers are responsible for the delivery of malaria services through integrated management of childhood illness (IMCI) and for mobilizing communities and other partners to address malaria at the household level. At the district level, primary duties include planning, resource allocation and management, as well as oversight of all facilities (both public, NGO and private) in the district. Districts are decentralized and are responsible for its respective health plans and budgets. At the central level, the NMCP supports implementation through policy formulation, standards setting and quality assurance, resource mobilization, capacity development and technical support, malaria epidemic control, and monitoring and evaluation.

NATIONAL MALARIA CONTROL PLAN

The Ministry of Health established the National Malaria Control Program (NMCP) in 1995. The third strategic plan for the period 2005/06-2009/10 has been finalized.

The NMCP goal is to control and prevent malaria morbidity and mortality so as to minimize related social ill effects and economic losses attributable to malaria in the country.

The overall objectives for the National Malaria Control Strategy 2005/06-2009/10 are:

- To go to scale nationally with a package of effective and appropriate core interventions that promote positive behaviour change and prevent and treat malaria; and
- To achieve rapid and sustainable high coverage levels for this intervention package.

⁶ Uganda HIV Sero-Behavioral Survey (UHSBS), 2004/5

⁷ It is not clear if Phase two of the Global Fund Round Two grant will be approved.

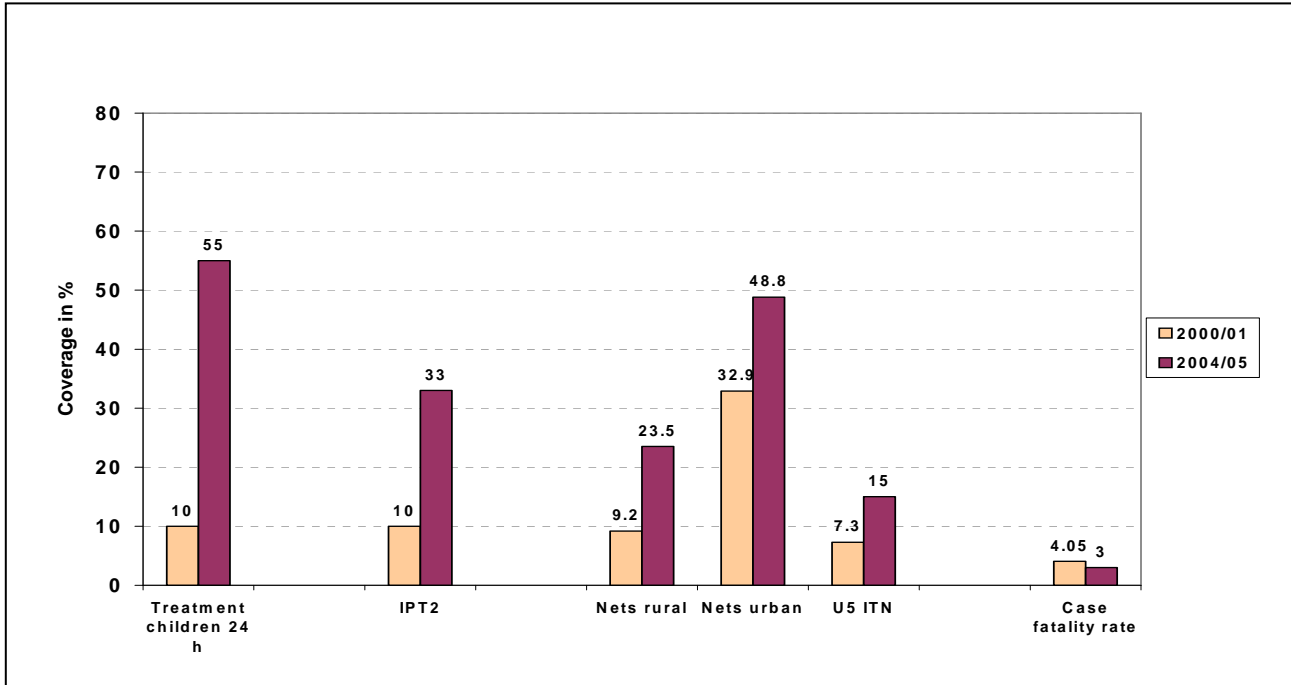
The core interventions include:

- Malaria prevention through ITNs with special emphasis on LLINs in highly-endemic areas;
- IRS with focus on low and epidemic-prone areas (prevention of malaria epidemics) and environmental management where this is feasible and effective;
- Universal access to ACT treatments and improved diagnosis as well as severe malaria management;
- Emphasis on treatment and prevention of malaria in pregnancy including IPTp;
- Intensive information, education and communication (IEC) efforts and social mobilization at all levels;
- Integration of malaria control into a balanced health system development with emphasis on human resource development; and
- Strong monitoring, evaluation, and operational research to monitor progress, evaluate impact, and continuously improve interventions.

Uganda has several strategy documents that support treatment and prevention of malaria including: Malaria in Pregnancy Control (2000); Home Based Management of Fever (2005); Policy and Strategy for Insecticide Treated Nets (2006); The Use of ACTs at the Community Level (Implementation Guidelines for the HBMF Strategy second edition: 2006); and Management of Uncomplicated Malaria, a Practical Guide for Health Workers, 3rd Edition, (2005), and the Policy and Strategy for Indoor Residual Spraying (2006).

In April 2005, the NMCP prepared a summary graph of results of the major malaria indicators, which are presented below.

National Malaria Indicator Coverage Rates for 2004-2005: Children under five years treated for fever within 24 hrs, IPT2, ITN by both urban and rural distribution.



The targets for 2010 written in HSSP II are to:

- i) Reduce case fatality rates amongst malaria in-patients aged less than five years from 4% in 2004 to 2% in 2010,
- ii) Increase the proportion of children aged less than five years getting correct treatment within 24 hours of onset of symptoms from 55% to 80%,
- iii) Increase the proportion of pregnant women attending ANC who have completed IPT 2 from 34% in 2004 to 80% in 2010,
- iv) Increase the proportion of households having at least one ITN from 15 % to 70%, and
- v) Increase the proportion of targeted structures for IRS in epidemic areas from 0% to 80%.

Coordinating mechanisms

Inter-Agency Coordination Committee for Malaria (ICCM): The ICCM provides a forum at the national level for all stakeholders to coordinate malaria control plans and activities as well as monitor progress against objectives and targets. Members include the major donors (USAID, United Kingdom Department for International Development (DfID), multilaterals (WHO, UNICEF), NGOs and FBOs, and the Ministry of Health representatives and the private sector. Four technical working groups have been established as part of the ICCM: vector control/ITNs; malaria case management (including malaria in pregnancy); IEC; and monitoring, evaluation and research.

MAJOR PARTNERS IN MALARIA CONTROL

In addition to government resources and funds channeled by international partners through budget support as part of the health sector wide approach (SWAp), major direct contributors to the funding

INTERVENTIONS - PREVENTION

INDOOR RESIDUAL SPRAYING

Current status

The Ministry of Health/ NMCP Uganda would like to implement IRS for malaria control to complement the scale-up and use of ITNs. The GOU is developing a document, *Policy and Strategy for Indoor Residual Spraying*, which recommends routine IRS in 15 districts. These 15 districts have 1 – 1.5 million households and represent approximately 20% of the total population in Uganda. Funding for IRS in these fifteen districts was requested under the GFATM Round Two, Phase Two grant. The NMCP is also interested in using IRS in highly endemic areas. Since the IRS program is new to Uganda, the future strategic directions and the partnerships are still being explored and lessons are still being learned from first spraying in Kabale with ICON-WP.

The major malaria vectors in Uganda, *Anopheles gambiae s.l.* and *An. Funestus*, are both highly endophagic and endophilic (feed and rest indoors) making IRS a viable strategy. Existing data shows that the vectors are susceptible to deltamethrin, permethrin and dichloro-diphenyl-trichloroethane (DDT). While DDT lasts longer,⁸ concerns about safety and leakages into the agricultural sector have prompted the NMCP to use synthetic pyrethroid formulations (Lambda-cyhalothrin, deltamethrin and alpha-cypermethrin) in 10% WP (wetable powder). Lambda-cyhalothrin is currently registered in Uganda for use with IRS, per WHO recommendation.

In the past, malaria vector control through IRS has been used effectively for epidemic control and eradication efforts in Uganda. Under the Malaria Eradication Program between 1959 and 1963, elimination of malaria was nearly achieved in the southwestern low transmission area in Uganda using DDT. *Anopheles funestus* was practically eliminated while *An. gambiae sensu latu (s.l.)* densities were dramatically reduced resulting in a marked reduction in malaria-related hospital mortality and hospital admissions, and outpatient attendance.

In recent years, a series of malaria epidemics have occurred in highland areas of Uganda and some have been controlled using IRS. Between 1992-and 1998, epidemics occurred in Rukungiri, Kabale, and Kapchorwa. In 1998, most of the low endemicity areas and highland districts in the southwest experienced a severe epidemic following the *El Nino* rains, resulting in high mortality and serious socio-economic consequences. Some of these epidemics were partially controlled using IRS with ICON™ 10% WP ; however, the program felt that the magnitude and impact of these epidemics could have been minimized if the epidemics had been forecasted and more extensive control measures had been used. In 2001, targeted IRS with lambda cyhalothrin (ICON™ 10% WP) successfully controlled a malaria epidemic in Kabale and in June and July of 2005, a World Vision-supported scattered IRS program controlled another epidemic in the sub-county Rukiga of Kabale district.

⁸ Evidence from South Africa indicates that the effective lifetime of pyrethroids on mud walls is significantly shorter than that of DDT

As part of its expansion of IRS, the MOH/NMCP is interested in using IRS for controlling malaria in IDP camps. As a result of a meeting to review malaria control and case management in northern Uganda (Kitgum, 16th – 17th March 2006), the MOH conducted rapid assessment of the feasibility and cost implications of IRS use in IDP camps, accessibility of camps for IRS applications, availability of water for IRS, average surface area of households in each IDP camps and to document previous IRS experiences and the practice of re-plastering structures in IDP camps. This assessment found that IRS is feasible in camps where the security is not a major hindrance, the household structures are suitable for IRS, and IRS is likely to be accepted by the communities.

Summary findings of the feasibility study on IRS in malaria control in IDP camps of Northern Uganda

District	Camps surveyed (Total)	Structures	Population	Est. house surface area (M ²)	No of water points	Security situation (good/fair/poor)	No of camps previously sprayed
Apac	19 (19)	86,374	171,458	1,718,842	85	2/13/4	7
Gulu	36 (54)	207,501	579,745	5,146,024	334	9/21/6	3
Kitugum	19 (24)	129,816	345,502	2,323,706	309	4/15/0	3
Lira	43 (43)	248,520	600,537	5,442,588	332	24/19/0	5
Pader	23 (57)	164,469	340,689	4,588,685	250	2/20/1	5

Reference: Feasibility of conducting indoor residual spraying (IRS) for malaria control in IDP camps of Northern Uganda; A draft report of a rapid assessment. 7th -30th April, 2006 WHO/MOH.

The NMCP also would like to use IRS in one highly endemic district. The MOH/NMCP strongly proposes to conduct IRS in Apac district, the highest transmission area (EIR=1,564) in Uganda, with a follow-up ITN campaign to sustain the gained achievements. It is hoped that this approach will bring down the vector density and reduce the entomologic inoculation rate (EIR). In combination with ITNs and case treatment both at facility and community levels, IRS should reduce further transmission of the disease.

Progress to date

Under the PMI year one funding, the PMI supported an IRS campaign in the epidemic-prone southwest district of Kabale from June-August 2006. The campaign was highly successful, with ≥85% coverage of houses and population protected. 100,000 households were sprayed and total population of 480,000 (98%) persons was covered. Because of the high coverage and public acceptance for spraying, the NMCP is keen on conducting larger-scale, well-targeted, timely IRS campaigns in both unstable and stable transmission areas. Morbidity and mortality data on fever and lab diagnosed malaria will be followed closely over the next few months to evaluate further the impact of IRS.

Proposed Year 2 activities

PMI will support the NMCP's efforts to implement an evidence-based targeted, cost-effective and sustainable IRS program. In year two, the NMCP needs support for further expansion and strengthening of the IRS program in higher transmission areas of the southwest epidemic-prone districts (Kabale and Kanugu), endemic districts (Apac district), and areas of complex emergency situations (i.e. IDP camps).

The implementation of this approach will require close entomologic monitoring and evaluation as described in the Monitoring and Evaluation section. For Apac, specifically, a sero-prevalence rate in children under five could be established both before and after the implementation phases. Strengthening of malaria surveillance indicators and diagnostic capacity should be done prior to IRS in all districts. At least one sentinel site in each district being sprayed should be established to ensure evaluation of all malaria indicators at a facility level.

The MOH has requested assistance to develop a Ugandan IRS program capable of training, organizing, and supporting the 'phased-in' IRS expansion to the 15 surrounding districts over the next four years. Specific assistance will be provided to purchase insecticide, spray pumps, spare parts, personal protection equipments, rent vehicles, and storage facilities. The NMCP also requests assistance for IRS planning, personnel management, environmental and human health safety and logistics management including forecasting and procurement of insecticide, on-the-job training of spray personnel, and IRS data management including the mapping and stratification of areas for IRS.

The use of ICON-CS, a long-acting pyrethroid, in year two IRS program has been proposed. It is expected that ICON-CS will receive WHOPEs approval in November 2006. Since ICON-WP was approved through the PERSUAP in 2006, it is not necessary to repeat the same for ICON-CS since the chemical is identical. However, Uganda National Environmental Management Authority still needs to approve ICON-CS and this approval is expected by the end of 2006. There has been MOH and GOU interest in using DDT for IRS in Uganda; however, this issue is very controversial. If the government and relevant agencies approve its use in the country, the PMI will support the development of a PERSUAP for DDT and explore its use for IRS.

In summary, specific activities include: (1) strengthening of human resource capacity for the IRS teams at all levels through on-the-job training with a contractor hired to conduct the year two IRS activity as well as input from technical partners with expertise in specific areas (quality assurance, logistics, procurement, certification, IEC); (2) comprehensive environmental impact assessments for DDT; (3) strengthening and upgrading of existing surveillance activities designed to track clinical and diagnostic data and predict epidemics; and (4) technical support from appropriate technical partners to the M&E unit of NMCP for vector-insecticide interactions assessments (resistance, repellency, outdoor biting) (Please refer to monitoring and evaluation section).

Proposed year two activities (\$5,780,000):

1. *Support second round of IRS in Kabale District:* The PMI will assist the NMCP and its partners with second round of IRS in 'high risk' villages in Kabale District covering 50% of households described in the MOH briefing document "Kabale District - Parishes most affected by malaria" using lambda cyhalothrin (\$780,000).
2. *Support one round of IRS in Kanungu District:* The PMI will conduct one round of spraying in this highland area, which has both high transmission and epidemic-prone transmission. It is estimated that 70% of households in the district fall within a malaria risk zone (\$1,500,000).

3. *Support one round of IRS in Apac District followed by house-to-house ITN distribution and formative evaluation:* As an innovative approach PMI will assist NMCP/MOH to conduct one round of IRS in the highly endemic Apac district in northern Uganda followed by house-to-house net distribution as a sustainable measure. Formative evaluation of this approach will be on-going throughout the following two years (\$2,250,000).
4. *Support one round of spraying in selected IDP camps in Northern Uganda:* The PMI will support one round of spraying in selected IDP camps in Pader, Kitgum and Gulu, the three main malarious and conflict districts of northern Uganda (1,000,000).
5. *Support the MOH in IEC/BCC/community mobilization:* Activities will include development of an IEC/BCC malaria module specific for IRS and campaigns to mobilize and educate communities on what IRS is, its benefits and risks, and proper procedures for safety and community participation (\$250,000).

Note: Under new demarcation of districts in Uganda , PMI will conduct IRS in nine districts. Kabale, Kanungu, Apac, (now 3 districts), Gulu (now 2 districts) Kitgum and Pader.

INSECTICIDE-TREATED NETS

Current Status

Current coverage of children under five years of age and pregnant women who sleep under ITNs remains low. Only 39% of under fives and pregnant women sleep under ITNs, and national household coverage (households owning one or more nets) is 26%.⁹ Geographically, coverage varies widely and districts having a higher nuisance mosquito problem have an increased use of ITNs. Correct and consistent use of LLINs by the target population continues to be poor; many people do not use their ITNs except during the rainy season.

To rapidly scale-up ITN coverage, Uganda is applying a mixed model approach to increase LLINs availability: distribution of free ITNs to vulnerable groups through ANC clinics and NGOs, large-scale campaigns to targeted populations, and the sale of ITNs through the retail market. This mixed model is complemented by annual net retreatment campaigns to ensure that ITNs maintain their effectiveness.

Through its Round Two GFATM grant, the NMCP is rapidly expanding free distribution of ITNs. In late 2006 through early 2007, the GOU will distribute 1.8 million free nets to vulnerable populations in a series of four regional campaigns. Given that these LLINs may not cover all the intended beneficiaries (6,800,000 children under five years of age and pregnant women or 26% of the target population), the programme will target an average of two to three sub-counties per district known to have the highest prevalence of malaria cases. Several NGOs (including PSI, AFFORD, MSI and others) have been contracted to facilitate the distribution of the LLINs with the help of community drug distributors (CDDs) and through ANCs. It is expected that this campaign will increase national net ownership (number of households with at least one ITN) to approximately

⁹ This net ownership is a 2004 estimate. In 2006, a DHS was conducted which is expected to provide more accurate statistics on net ownership and net coverage.

Finally, the PMI continues to support the private sector net market in Uganda through the *Netmarkplus* project which is working to create demand and ensure a consistent supply of ITNs. To create demand, *Netmarkplus* has supported educational cartoon advertisements for newspapers and billboards as well as in-store promotions to encourage net use. On the supply side, *Netmarkplus* has worked to increase the number of LLINs distributors and sellers in the country. Currently, there are over 1164 LLIN/ITN outlets in the country. Between October 2005 and June 2006, 434,217 nets were sold through the private sector and over 60% of these were LLINs.

Proposed year two activities (\$6,025,000):

- 1. Procure and distribute free LLINs through ANC clinics and the LLIN net facility:* This will continue the LLIN distribution activities that began in FY06 which used ANC clinics to target pregnant women. The PMI will also provide free LLINs to community-based NGOs and FBO to allow them to distribute nets to pregnant women and children under five (\$3,150,000).
- 2. Partnership with new donor to distribute LLIN in selected districts as a follow up to GFATM net distribution campaign:* The PMI will work with another donor to distribute its \$2 million donation of LLINs to PMI target populations. These LLINs will be distributed as a follow-up to the four regional campaigns planned for the distribution of the LLINs supported through the Global Fund in the districts with low net coverage and high burden of malaria. The PMI will partner with this program by funding the distribution and IEC costs, as well as by providing an additional 100,000 LLINs for the campaign (\$1,100,000).
- 3. Continue an annual ITN re-treatment:* The PMI will support the re-treatment of existing nets in 29 selected districts with a population of 10.8 million people in 2.2 million households. The previous campaign retreated approximately 74% of existing nets. The launch date for this follow-up re-treatment campaign is January/March 2007 in order to ensure continued efficacy of these ITNs. Approximately 715,000 nets will be retreated. If KO Tab 1,2,3@ is WHOPEs approved, it is expected that it will be used. The campaign will be accompanied by an IEC campaign (\$700,000).
- 4. Procure and distribute subsidized nets through the private sector (35,000 nets)* The PMI will support the subsidized net market by providing 35,000 LLINs for sale in the private sector. These LLINs will receive a \$3 subsidy and will help generate demand for LLINs and increase availability of LLINs when the campaign distributions are complete (\$250,000).
- 5. Support of the private sector for ITNs and monitoring net distribution:* PMI will continue to support the development of the private sector net market and implement a program to expand ITN distribution to open markets in rural and peri-urban areas targeting vulnerable populations (e.g. pregnant women and children under five). Specifically support will focus on the continued communication strategy with a particular focus on encouraging the purchase of LLINs or retreating existing nets, the introduction of new LLIN brands, and the development of in-country net manufacturing capacity (\$550,000).
- 6. Support Ugandan National Bureau of Standard (UNBS) to improve its capacity to monitor net quality:* The PMI will assist Ugandan National Bureau of Standard to improve its capacity to standardize nets, ITNs and netting material that is used to produce mosquito nets and to monitor the

quality of those ITNs. This will include provision of equipment, setting standards and guidelines and training of relevant staff (\$75,000).

7. *Evaluation of net usage and identification of mechanisms to increase coverage rates:* There are concerns that the LLINs are not being retained or correctly and consistently used by the target population. This public health evaluation will determine the current usage practices and will result in better usage at the household (\$100,000).

8. *Continue IEC on correct and consistent use of LLINs:* The PMI will continue to support behavior change at community level and mass media activities to ensure that the LLINs are correctly and consistently used (\$100,000).

INTERMITTENT PREVENTIVE TREATMENT

Current status

In 1998, IPTp for pregnant women was adopted as national policy and it was recommended that all pregnant women should receive two doses of SP after the first trimester as part of the MOH's focused-antenatal care package (FANC). The MOH advises pregnant women who are having a normal pregnancy to make four visits to the ANC clinic for FANC prior to delivery. The 2004 NMCP report on malaria in pregnancy activities showed that approximately 95% of pregnant women in Uganda attended ANC at least once during their pregnancy. Of those women, 80% returned for a second visit. Very few women attend the recommended four times; 60% of women deliver at home.

At the national level within the NMCP, malaria in pregnancy activities are implemented jointly with the Reproductive Health Unit (RH). The RH and NMCP are jointly responsible for the implementation of the program through training, support supervision, monitoring and evaluation, operational research, and provision of IPT services at health facilities and in the community.

Although IPTp has been the policy for eight years, its scale-up has not been national. IPTp coverage varies by different districts ranging from 10% to 50%, with a national average of IPT₂ (two doses of IPT during pregnancy) of 35%. Although a second visit prior to delivery is common, there are several reasons that contribute to the low second dose of IPTp: 1) intermittent drug supply with frequent stock outs of SP; 2) lack of sufficient personnel to keep accurate records; 3) women preferentially attend ANC clinics of perceived higher quality resulting in an overburdened system and thereby a reduction in services provided; 4) poor morale among the overwhelmed staff; 5) pregnant women present for the first time too late to take a second dose of SP; 6) lack of basic clean drinking water and cups for direct observation of IPTp; and 7) a perception that taking drugs during pregnancy may cause harm to the baby. The table below shows that the majority of women in at least two areas attend ANC for the first time in the second trimester.

Proportion of pregnant women in Banumka and Kapeeka sub-counties (N=768) and the time of first presentation at the ANC, National Malaria Control Program, 2006.

First presentation to ANC	Sub-county Banumka	Sub-county Kapeeka
1st trimester	9%	8.5%
2nd trimester	90%	88%
3 rd trimester	1.5%	3%

To increase the uptake of IPTp, the NMCP has considered developing a directly observed treatment approach for IPTp at the community level that would be integrated with the HBMF and other community-based interventions. This approach would need to be sensitive to the complex cultural attitudes of women during pregnancy and should avoid acting as a deterrent to women going to the ANC clinic. The NMCP is exploring different options to implement such an approach.

In the conflict areas of northern Uganda, the MOH has also expressed interest in integrating IPTp into the existing prevention of mother to child transmission (PMTCT) of HIV/AIDS efforts. All those living within the camps will be sensitized on this strategy and mothers will be encouraged to attend ANCs. Support will be provided to the RH and NMCP to work with the data collection unit of MOH to improve data collection process and analysis of IPTp uptake at the district level. Feedback will be given to each district accordingly.

PMI Progress to date:

In 2006, PMI facilitated a national review of the current implementation of IPTp involving the NMCP, the RH, all stakeholders, and NGOs. A multi-disciplinary technical team was established to review and adapt a FANC training manual as well as the facilitator’s guide. The team subsequently wrote an implementation plan for the re-training of health workers.

To create demand for IPTp by pregnant women, advocacy using appropriate IEC materials is being development for use at ANC clinic and community level. This approach will encourage pregnant women to attend ANC early and these messages are intended to expel the notion of SP being too strong of a medicine to use during pregnancy. Advocacy will be headed by the district health education units in collaboration with the NMCP/RH utilizing all available media outlets.

Proposed year two activities (\$540,000):

1. *Conduct national FANC training for private sector and NGO sector health workers on IPTp:* Support will be provided for training private sector and NGOs who play a role in the delivery of IPTp services at community level (\$130,000).
2. *IPTp through ANC clinics in Northern Uganda:* This will include advocacy, training, logistical support, supportive supervision, and other areas relevant to IPTp strategy. All those living within the camps will be sensitized about this strategy and pregnant women will be encouraged to attend ANC (\$130,000).

3. *Integrate IPTp with PMTCT/MCH:* IPTp will be integrated into PMTCT efforts and health workers will be orientated at all levels. The support will be provided for implementation of this approach in existing PMTCT/MCH clinics, including supportive supervision and monitoring and evaluation of the approach (\$130,000).
4. *Continue to support for the MOH IEC district advocacy plan:* The health education unit of selected districts, in collaboration with the NMCP, will conduct community level advocacy on IPTp to encourage pregnant mothers to early uptake and complete IPTp doses (\$150,000).

INTERVENTIONS – EPIDEMIC RESPONSE

EPIDEMIC SURVEILLANCE AND RESPONSE

Current Status

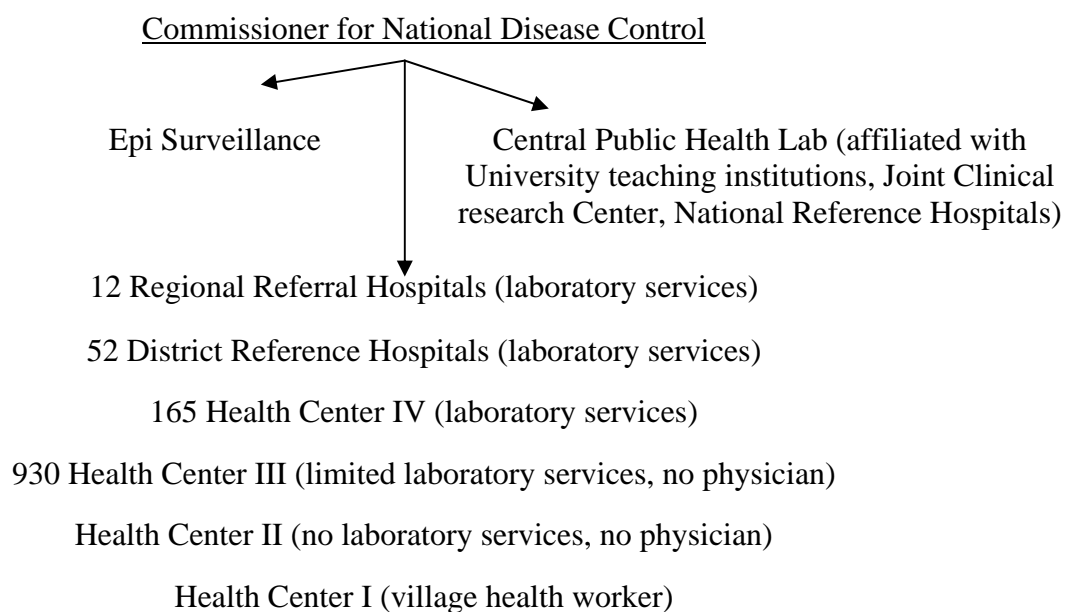
Epidemic malaria and seasonal transmission of malaria occurs in districts in the highland regions of southwest and eastern Uganda. If the number of malaria cases exceeds the expected seasonal transmission threshold, it will be necessary to investigate the epidemic. While the NMCP includes early detection and rapid containment of malaria epidemics as one of its objectives, existing systems for epidemic detection and response are generally weak and poorly organized. There is a threshold established for each epidemic-prone area; however, the sensitivity of this threshold is unknown. Districts report health information, including cases and deaths due to clinical malaria, on a weekly basis through the routine HMIS system. However, compilation of data, analysis and availability of information for decision making is generally delayed. The Central Public Health Laboratories also feed information into the MOH surveillance systems. This results at times in high reported rates of malaria from districts which are never investigated. Without investigation, an appropriate response cannot be mounted and epidemics may not be contained quickly and effectively.

Although guidelines exist for epidemic response and containment, there tends to be inconsistency in response due to some of the following factors: 1) reporting of increased numbers of cases may be slow in reaching the district and national level; 2) analysis of the reports from district and national level may be delayed; 3) once an epidemic is suspected, there may be lack of both funding for fuel, available personnel, and diagnostic capacity to address the epidemic (RDTs, microscopy, reagents etc.); and 4) and lack of surge capacity in commodities to respond with a strong intervention (additional drugs, ITNs, IRS).

The Highland Malaria (HIMAL) surveillance project has been working to develop a system for the early detection of epidemics. This project attempts to predict epidemics through weather forecasting. It has provided valuable information on epidemic response and has significantly improved clinical malaria surveillance in southwest Uganda. Building on the work of this project, Uganda now has improved capacity to detect epidemics in this region.

Proposed year two activities (\$75,000):

Ugandan MOH Laboratory Organogram



The facilities include 104 hospitals (57 government, 44 NGO and 3 Private), 250 health centers (179 government, 68 NGO and 3 private), palliative care 2 (government 1, NGO 1) and others (989 government, 352 NGO and 41 private).

With PEPFAR funds, 35% of the national requirements of microscopes have been purchased and AMREF has conducted quality assessments in the various facilities and trained laboratory personnel on laboratory management and quality control. Through the GFATM Round Two, 150 additional microscopes (representing 25% of the national need) have been ordered, however the 150 microscopes have yet to arrive in country. Even if all the microscopes were available, a 40% deficit would remain amounting to 360 microscopes.

A promising new project has been launched by the Institute of Infectious Diseases (IDI) of Makerere University in collaboration with the UMSP to develop a strong training program to address many of the weaknesses in laboratory diagnostic capacity and integrated clinical management of malaria cases. With some funding from EXXON/Mobil, the project plans to provide an integrated comprehensive training for 200 laboratory personnel and lab technicians at district hospitals and health centre IVs, and provide an upgrade training for clinicians to improve expertise in clinical management of uncomplicated and severe malaria. Additional contributions would allow for the doubling of the number of laboratory technicians and clinicians trained in 2007. Following the training, mobile surveillance teams will visit each facility to provide supportive supervision, additional training, and quality control.

Once the training of the initial laboratory technicians is complete, they will work together with the mobile team to train health center III staff members in the field. The mobile teams will work closely with the district laboratory focal person to coordinate and monitor district level training and quality control of laboratory diagnosis for each health center III.

Monitoring and evaluation to measure progress against project goals and targets, to inform project implementation, and to facilitate adjustments in implementation is a critical component of the PMI. In Uganda, rapid scale-up of malaria prevention and control interventions and achieving high coverage rates with ACTs, ITNs, IPTp, and IRS are priorities not only for the PMI, but also for the NMCP, the GFATM, and other national and international partners working on malaria. For this reason, efforts will be made to coordinate all monitoring and evaluation activities and ensure uniformity of indicators, data collection and analysis methods, and reporting.

The 2006 Demographic and Health Survey (DHS) will be completed by late 2006 and will serve as the baseline data for the PMI. The current level of malaria-mortality will be estimated using several different mechanisms including verbal autopsy, Demographic Surveillance System (DSS) site, and sentinel site surveillance. The 2007, Uganda Service Provision Assessment (UgSPA)/Health Facility Survey (HFS) will be used to monitor the availability and quality of health services.

Evaluation of Progress toward the President's Malaria Initiative Goal and Targets:

The PMI evaluation plan in Uganda consists of several major components:

- Evaluation of impact on all-cause mortality. Given that the majority of malaria cases are not laboratory confirmed, it is difficult to assess the burden of the disease. However the PMI will continue to evaluate the trends in the NMCP surveillance monitoring system and it is expected that improvements in laboratory diagnosis, surveillance reporting and data management will improve the ability to measure this indicator.
- Evaluation of coverage rates for the four key interventions, ACTs, ITNs, IPTp, and IRS (e.g., percentage of pregnant women sleeping under an ITN the previous night). This will be routinely collected from PMI partners via the MEMS project.

Monitoring indicators for Malaria Mortality and Morbidity

The overall goal of the PMI program is to decrease malaria mortality by 50%. Diagnosis of malaria may be laboratory confirmed in some district hospitals but generally the cause of illness or death is based on clinical case definition. Since the clinical findings of malaria may overlap with other common childhood diseases, it is difficult to differentiate causes of morbidity or mortality or the impact of PMI interventions. Laboratory confirmation of malaria is strongly supported by the MOH and efforts are being made to improve and sustain the capacity of the laboratories nationally.

Data collected through verbal autopsy, sentinel sites, and demographic sentinel system (DSS) surveillance will augment all-cause mortality with estimates of proportions of deaths attributable to malaria and also provide measures of morbidity (confirmed cases, hospitalized cases, severe anemia and transfusions) from available data including national representative surveys and selected sites.

Data sources for malaria-related indicators

Data sources for malaria related indicators may be found through the following sources:

- DHS conducted by the Ugandan government, 2006 (This will provide background information for national level verbal autopsy in 2007);
- NMCP district morbidity and mortality surveillance collected through the Health Management Information Systems (primarily clinical malaria);

- Verbal autopsy validation study (2006 funded with expected 2007 completion date) through the Uganda Malaria Surveillance Project;
- Verbal autopsy survey 2007 (establishment of malaria attributable deaths baseline),
- Sentinel Site Surveillance – UMSP and MOH (by the end of the 2007 we may have some data on malaria-attributable mortality); and
- DSS coordinated through the Institute of Public Health at Makerere University will provide malaria mortality and all-cause mortality data .

The HMIS system

Uganda's HMIS collects disease and case incidence data from all districts in Uganda. Most districts report from 60% of all sub-districts and some report from as many as 70-80% of sub-counties. There is an upward cascade of reports: from the health units to Health Sub-districts (HSDs), to district headquarters, then to the MOH. Additionally, the MOH has put in place an Integrated Disease Surveillance and Response system which also collects data from the facility level. Through the HBMF program, community data is available and is to be reported to the health facility, but it is incomplete and of poor quality and not generally aggregated at district or national levels.

At the national level there is a lack of proper analysis of the general district level malaria indicators for surveillance in the 77 districts. This impedes the NMCP progress in development of targeted approaches to malaria control, understanding of when outbreaks of malaria are occurring and responding appropriately, and/or formulating plans for high risk groups.

Monitoring Through the DSS

There are two DSS sites in Uganda. The first, the Rakai Health Sciences Program is well established and has focused primarily over the last 17 years on HIV/AIDS research in the adult community. The second DSS is associated with the Makerere University Institute of Public Health and is located in the districts of Mayuge and Iganga. The PMI will work to strengthen this DSS and data from these sites will be used to monitor all cause mortality in children under five year olds as well as malaria attributable deaths. It could also evaluate the impact of the new malaria treatment policy (ACT) on malaria morbidity and mortality within the DSS. These evaluations are not available in any other population-based assessment and could potentially help guide MOH policy decisions.

The 2006/07 Uganda Service Provision Assessment (UgSPA)/Health Facility Survey (HFS)

The 2006 UgSPA is a nationwide facility-based survey designed to collect information on the availability and quality of reproductive and child health care, infectious disease (malaria and TB) and HIV/AIDS services provided to Ugandan men, women and children in public, private and not-for-profit health facilities. The survey will gather information on quality of care provided to malaria patients in areas of diagnosis, treatment, counseling and education. The information generated from the survey will serve as both situational analysis/baseline, identify ways to improve services and will provide further monitoring and evaluation of the scale-up of malaria interventions.

Approximately 630 facilities will be included in the sample and the sample of facilities will be designed in such fashion as to allow for national and regional estimates for key indicators.

Entomological and Epidemiological Monitoring and Evaluation

The Uganda MOH has some strength in support of entomologic and vector control infrastructure. This includes the Vector Control Unit (VCU) of the NMCP (Kampala), with good technical level entomologists: the Entomology Department and the Uganda Virus Research Institute (UVRI), in Entebbe which has three PhD-level mosquito experts as well as trained technical staff.

These three groups worked together last year to establish a vector insecticide resistance monitoring program for the IRS activity in Kabale. A CDC/UVRI /NMCP/VCU/ RTI training in the use of the bottle bioassay for mosquito insecticide-resistance monitoring was held at UVRI in March of 2006 which was supported by PMI.

The NMCP should be monitoring and evaluating the following as it rolls-out more aggressive use of LLINs and IRS:

- Monitor mosquito populations for susceptibility to insecticides to detect selection for physiological and behavioral insecticide resistance associated with IRS/ITN use. Behavioral and physiological resistance can be monitored through WHO recommended human bait collections conducted inside and outside houses with IRS/ITNs using the CDC bottle assay, and subsequently identified to species and the sporozoite rate determined using the *P. falciparum* CSP ELISA. When resistance is identified, CDC/Atlanta staff will assist in identification of the mechanism(s) using biochemical and molecular methods.
- Indoor *Anopheles* vector densities to detect changes in IRS/ITN insecticidal efficacy and changes in man-vector contact rates. Efficacy should be monitored and evaluated using indoor pyrethrum spray collections with the mosquitoes collected identified to species and the sporozoite rate determined using the *P. falciparum* CSP ELISA.
- Quality assurance of IRS treatment and ITNs to verify both the initial efficacy and longevity of ITNs and IRS treatment. The standard WHO cone bioassay would be used for these evaluations.

Monitoring and Planning for IRS

The NMCP has interest in building the capacity to develop an information technology network to allow for real time evaluation of IRS/LLINs coverage through databases (PDAs) and mapping (GIS) and to provide information for evidence-based planning. There is a need to use equipment and technologies that will allow for more accurate and effective planning.

In IRS programs, PDAs will be programmed to map houses sprayed, record time required to spray each house, record time spent traveling between houses, record number of houses done each day, record number of people in each house, and the amount of insecticide sprayed. PDAs will help estimate personnel and transport costs associated with IRS program in areas with different population densities.

The use of bar coding to track insecticidal sachets and ID cards to relate the sachets to the sprayer can help address insecticide leakage. A similar approach may be used for ITN distribution and net retreatment campaigns with limited modification.

While entomology expertise is relatively high in Uganda, it is also necessary to provide additional entomological training in mosquito collection and identification. A CDC/UVRI /NMCP/VCU/ RTI meeting will be planned for 2007 to coordinate, discuss and review technology for monitoring transmission rates in Apac (proposed site of IRS + LLINs) and to build local capacity to estimate vector density, infectivity, and entomological inoculation rates. An insectory to rear mosquitoes is needed for the bioassays.

Insecticidal-Treated Mud Evaluation

The smearing of walls with fresh mud every 2-3 months is common in northern Uganda and many other countries where adobe-like structures are built, but this practice may compromise the insecticidal effect of IRS. Initial and on going studies at the CDC insectory have shown promising results using a mud-based insecticide (ICON EC) smeared on a mud wall, showing that after week 13, there is still 70-80% knock down rate. The next steps in evaluation of this potential intervention are a field-based evaluation.

The IDP camps of northern Uganda are an ideal place for the evaluation of 'smart mud' due to the prevalence of smearing, and the relatively high level of entomological capacity compared to other countries. A sample of mud houses would be chosen and smeared with the insecticidal mud. A formal detailed protocol is being written which takes into consideration all the safety issues, monitoring and efficacy testing involved in this kind of evaluation.

Proposed year two activities (\$1,295,000):

1. *Strengthen national level analysis of malaria surveillance data:* In year two, the PMI will continue support to HMIS to increase malaria data quality to evaluate impact on malaria epidemiology in the areas where vector control, especially IRS, has been implemented. Currently there is no mechanism in place at the malaria control program to evaluate these large scale implementations (\$30,000)
2. *Strengthen one DSS site:* In year two, the PMI will focus on strengthening the Makerere University DSS site which may provide the necessary data to measure all-cause mortality and malaria related mortality. They may also provide information on cACT use (\$100,000).
3. *Support verbal autopsy to the 2007 DHS:* Verbal autopsy allows the DHS to identify malaria deaths and thus create a baseline of malaria mortality. Concurrently, this will provide an opportunity to examine the sensitivity and specificity of verbal autopsy to identify malaria deaths¹² (\$200,000).

¹² The verbal autopsy validation study will be completed in 2007. This study could not be adequately done for the amount allocated from year 1. The VA national survey will be done after the validation study and will need additional funding to complete it.

ACTIVITY	2006	2007											
	SEP-DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
Training													
Entomology training													
Training spray squads													
Training on net re-treatment													
IPT training for private/NGO sector													
Training private sector on ACT													
Training CDDs on HBMF with ACT													
Training lab technicians on malaria diagnosis													
Services													
IRS Kabale/Kanungu													
IRS Apac													
IRS IDPs													
Free LLINs distribution-ANC													
LLINs distribution- community													
LLINs distribution- Private sector													
Net re-treatment campaign													
Improve UNBS capacity to monitor net quality													
IPT ANC/PMTCP													
Epidemic investigation/ response													
Improve & support NMS's supply chain management													
Implement and improve system for testing fraudulent drugs													

ACTIVITY	2006	2007											
	SEP-DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
Support supervision													
Support supervision to malaria control interventions													
Supervision to CDDs involved in c-ACT													
Monitoring & evaluation													
IRS Environmental monitoring													
Base line and post entomological surveys/mapping													
Follow up net usage, retention & sustainability													
Monitor drug resistance & adverse reactions to AMDs													
Verbal autopsy validation study/survey													
DSS													
Facility survey													
HMIS malaria data improvement													
IRS epidemiological monitoring													
PMI reporting & data collection													
Staffing													
Hire 2 PMI FSN in-country staff													

**Table 2
PMI Planned Obligations FY 2007**

Proposed Activities	Mechanism	Budget \$	Commodities	Geographic Area	Description of Activity	Relation to Intervention
PREVENTION ACTIVITIES						
Second round of Indoor Residual Spraying (IRS) in targeted (low elevation) areas of Kabale district	IRS IQC	\$780,000	\$280,000	Kabale District	IRS management, purchase insecticides, spare parts, etc. conduct refresher training and implementation of IRS in low elevation, high risk areas (50% of district households).	IRS
One round of IRS in high transmission areas of Kanungu district	IRS IQC	\$1,500,000	\$685,000	Kanungu District	IRS management, logistics, training, rented storage & transport. Environmental/ human health monitoring. IRS implementation in high transmission risk areas (70% of district house holds)	IRS
One round of IRS in Apac district with ITN distribution (cost of nets not included)	IRS IQC	\$2,250,000	\$1,015,000	Apac District	IRS management, logistics, training, rented storage & transport. Environmental / human health monitoring. IRS implementation & provide background support for ITN distribution & formative evaluation.	IRS
One round of IRS in selected IDP camps in Northern Uganda	IRS IQC	\$1,000,000	\$470,000	Northern Districts (Pader, Kitugum, Gulu)	IRS management, logistics, training, rented storage & transport. Environmental / human health monitoring. IRS in selected IDP camps	IRS
IEC/community mobilization for IRS	Health Communications Partnerships (JHU/CCP)	\$250,000		Apac, Kanungu, IDP camps (Kabale)	Develop IRS IEC/BCC module and conduct community mobilizations to increase acceptance for IRS	IRS

Sub Total (IRS)		\$5,780,000	\$2,450,000			
Procure and distribute free LLINs through ANC clinics, and the LLINs net facility.	AFFORD (JHU/CCP)	\$3,150,000	\$3,025,000	National	Purchase 550,000 LLINs and distribute freely to pregnant mother and children under 5 nationally through ANCs, net facilities and NGOs/FBOs.	ITN
Partnership with new donor to procure and distribute LLINs	AFFORD (JHU/CCP)	\$1,100,000	\$550,000	Selected districts	Purchase 100,000 LLINs and distribute 450,000 nets to vulnerable groups in campaign manner with IEC through NGOs/FBOs	ITN
Continue an annual net retreatment campaign	UPHOLD (JSI/ Malaria Consortium)	\$700,000	\$315,000	Selected districts	Mass re-treatment of 700,000 untreated nets in 29 districts.	ITN
Procure and distribute subsidized nets through the private sector	AFFORD (JHU/CCP)	\$250,000	\$210,000	National	Purchase 35,000 LLINS and distribute subsidized nets through private sector once the net campaigns completed.	ITN
Continue to develop private sector net market	NetMarkplus (AED)	\$550,000		National	Support development of the private sector net market including IEC	ITN
Improve UNBS capacity to monitor net quality	NetMarkplus (AED)	\$75,000	\$25,000	National	Develop capacity of UNBS to monitor the quality of mosquito nets, provision of equipments, setting standards and guidelines and training relevant staff	ITN
Evaluation of net usage, retention and sustainability	CDC/TBD	\$100,000		National	Follow up formative evaluation of retention and usage of nets to determine the current usage practices and inform policy decisions.	ITN

Continued IEC on correct and consistent use of LLINs	AFFORD (JHU/CCP)	\$100,000		National	National level mass media and community IEC campaign for LLINs	ITN
Sub Total (ITNs)		\$6,025,000	\$4,125,000			
National level FANC training on IPT for private/ NGO sector	UPHOLD (JSI/Malaria Consortium)	\$130,000		National	Provide training on the administration of IPT to private sector and NGO nationally, as part of a reinvigorated ANC	MIP/IPT
IPT through ANCs in northern Uganda	Northern Uganda Project (JSI/NGO partners)	\$130,000		Northern Districts	Facilitate IPT at ANC clinics in Northern Districts	MIP/IPT
IPT through national PMTCT/MCH system	TBD	\$130,000		National	Facilitate IPT at ANC clinics in PMTCT/MCH Districts	MIP/IPT
Continue support to IEC/BCC on IPT	Health Communication Partnership (JHU/CCP)	\$150,000		National	Provide supportive community BCC to encourage women to seek 2 doses of IPT	MIP/IPT
Sub Total (IPT)		\$540,000	\$0			
Support to epidemic investigation and response	WHO	\$75,000	\$50,000	National	Support for investigation of suspected malaria outbreaks. Diagnostics, drugs, equipment and IEC for malaria epidemic containment.	Epidemic control
Sub Total (Epidemic)		\$75,000	\$50,000			
TOTAL: Preventive		\$12,420,000	\$6,625,000			

TREATMENT						
Procure ACTs to fill shortage	UNICEF	\$2,725,000	\$2,725,000	National	Procure pediatric doses of ACT to fill the gap	Case Management
Logistics, supply chain management & rational drug use support.	RPMplus (MSH)	\$500,000		National	Continue technical and logistical support (Transport/ storage) to NMS/ MOH to roll-out ACTs, other anti malarials and LLINs.	Case Management
Continue to train private sector drug distributors on correct ACT use	AFFORD (Malaria Consortium)	\$50,000		National	Provide training to private sector health care providers on use of new ACT malaria treatment policy/guidelines	Case Management
Continue to provide supportive supervision to malaria control activities by center & district	UPHOLD (JSI/Malaria Consortium)	\$100,000		National	Supportive supervision by malaria control staff focusing on new ACT policy, definitive diagnosis, cACT roll out and vector control (ITN, IRS) to ensure the implementation.	Case Management
Provide supportive supervision to CDDs involved in c-ACT	Northern Uganda Project (JSI/NGO partners)	\$100,000		Northern Districts	Support for supervisory visits, quarterly supervision meetings and reporting	Case Management
Training community health workers on HBMF with ACT	Northern Uganda Project (JSI/NGO partners)	\$100,000		Northern Districts	Provide training on new ACT treatment policy to community health workers in districts where the NDA approved cACT through HBMF	Case Management

IEC/BCC on ACT roll-out	Health Communication Partnerships (JHU/CCP)	\$110,000		National	Provides information and educational, media support for roll-out of ACT drug policy	Case Management
Management of malaria microscopy training and logistical support for strengthening diagnostic capacity at health facilities	CDC grant to UCSF/Institute of Infectious Diseases	\$150,000	\$75,000	National	Organize, administrate and manage lab technician & clinician high quality training on malaria microscopy, provide 50 microscopes/accessories and lab supplies.	Case Management
Malaria microscopy training and quality control in coordination with CPHL	CDC grant to UCSF/Uganda Malaria Surveillance Project	\$300,000		National	Conduct TOT for lab technicians/clinicians/data managers at the central level, facilitate training of lower level health centers in the field. Cost for transportation, fuel, equipment/supplies and training materials. Provide 2 malaria mobile teams to support field based training, evaluation, laboratory quality control and data management.	Case Management
Improve NDA capacity & implement system for testing fraudulent drugs at national level	U.S. Pharmacopia	\$200,000		National	Support for random testing of non-regulatory drugs which may be fraudulent.	Case Management
Monitor drug efficacy, resistance and adverse events reporting & build NDA's capacity	CDC grant to UCSF/Uganda Malaria Surveillance Project	\$200,000		National	Evaluate the efficacy and safety of combination antimalarial therapies being considered for widespread use or already being used in Uganda & building NDAs' capacity on this area	Case Management
TOTAL: Treatment	\$4,535,000	\$2,800,000				

